

REMARKS

Applicants again respectfully request examination of the Drawings, and that the Examiner indicate in the next Communication from the Patent Office if the Drawings are acceptable.

Applicants thank the Examiner for initialing the references listed on the PTO-1449 form submitted with the Information Disclosure Statement filed on December 13, 2002, thereby confirming that the listed references have been considered.

Claims 1, 2, 4-27 are all the claims pending in the application.

1. Claims 1, 2, 5, 12-15 and 26 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Ikata et al. (U.S. Patent No. 5,786,738). Applicants traverse the rejection of claims 1, 2, 5, 12-15 and 26 at least for the reasons set forth below.

To support a conclusion that a claimed invention lacks novelty under 35 U.S.C. § 102, a single source must teach all of the elements of a claim. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (Fed. Cir. 1986). A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently in a single prior art reference. ~~*Verdegaal-Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).~~ A single source must disclose all of the claimed elements arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989). Rejections under 35 U.S.C. § 102 are proper only when the claimed subject matter is identically disclosed or described in the prior art. Thus, the cited reference must clearly and unequivocally disclose every element and limitation of the claimed invention.

The Examiner states that bonding wires (34) directly connect the die of Ikata et al. to a high frequency/RF antenna (37a-37c/36c). *See* Figs. 2A, 2B of Ikata et al.; page 2 of the February 6, 2003 Office Action. The Examiner further states that the high frequency/RF antenna comprises a portion of the packaged integrated circuit and is excluded from the integrated circuit die. *See* Figs. 2A, 2B, 5; col. 5, line 1 to col. 6, line 27 of Ikata et al.; page 2 of the February 6, 2003 Office Action.

Notwithstanding the Examiner's position, Ikata et al. do not teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, and wherein the radio frequency antenna is excluded from the integrated circuit die, as recited in claim 1. It appears that the Examiner is confusing the phase matching circuit patterns (37a-37b) disclosed by Ikata et al. with the radio frequency antenna recited by the present invention. Ikata et al. disclose, *inter alia*, a duplexer that could be used in a mobile telephone to allow transmission and reception at different frequencies. The phase matching circuit patterns (37a-37b) are attached to an external antenna through an external connection terminal (36c). *See* col. 5, lines 24-36 of Ikata et al. There is no disclosure in Ikata et al. that the phase matching circuit patterns (37a-37b) function as radio frequency antennas. The external connection terminal (36c) disclosed by Ikata et al. is for ~~connecting to an antenna, and is not the antenna itself.~~ *See* col. 5, lines 22-26 of Ikata et al.

Likewise, the common terminal pattern (37c) disclosed by Ikata et al. merely connects the phase matching circuit patterns (37a-37b) to the external connection terminal (36c). Figure 7 of Ikata et al. also discloses phase matching circuit patterns (37a-37b), a common terminal pattern (37c) and an external connection terminal (36c). *See* col. 7, lines 26-45 of Ikata et al. Figure 11 of Ikata et al. discloses a meandering phase matching circuit pattern (68). *See* col. 9, lines 18-21 of Ikata et al.

In each of those embodiments, there is no teaching or suggestion that the phase matching circuit patterns are used as radio frequency antennas. In sum, Ikata et al. lacks any disclosure of a radio frequency antenna that comprises a portion of an integrated circuit package. And since the phase matching circuit patterns disclosed by Ikata et al. are not radio frequency antennas, it is self-evident that Ikata et al. does no teach or suggest excluding the radio frequency antenna from the integrated circuit die.

Based on the foregoing reasons, Applicants believe that Ikata et al. fail to disclose all of the claimed elements as arranged in claim 1. Therefore, under *Hybritech* and *Richardson*, Ikata et al. clearly cannot anticipate the present invention as recited in independent claim 1. Thus, Applicants believe that claim 1 is in condition for allowance, and further believe that claims 2, 5 and 12 are allowable as well, at least by virtue of their dependency from claim 1. Applicants respectfully request that the Examiner withdraw the § 102(b) rejection of claims 1, 2, 5 and 12.

Independent claim 13 has similar recitations as claim 1, and Applicants believes that claim 13 is allowable for at least the same reasons as claim 1, namely, Ikata et al.'s lack of disclosure with respect to a radio frequency antenna that comprises a portion of an integrated circuit package, and ~~which is excluded from an integrated circuit die.~~ Applicants further believe that claims 14, 15 and 26 are allowable as well, at least by virtue of their dependency from claim 13. Applicants respectfully request that the Examiner withdraw the § 102(b) rejection of claims 13-15 and 26.

2. Claim 4 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Masahito (Japanese Patent No. Heisei 8-250913). Applicants traverse the rejection of claim 4 at least for the reasons set forth below.

The initial burden of establishing that a claimed invention is *prima facie* obvious rests on the USPTO. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). To make its *prima facie* case of obviousness, the USPTO must satisfy three requirements:

1. The prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated to artisan to modify a reference or to combine references. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).
2. The proposed modification of the prior art must have had a reasonable expectation of success, and that determined from the vantage point of the artisan at the time the invention was made. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209 (Fed. Cir. 1991).
3. The prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991); *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, the nature of a problem to be solved. *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999). Alternatively, the motivation may be implicit from the prior art as a whole, rather than expressly stated. *Id.* Regardless if the USPTO relies on an

express or an implicit showing of motivation, the USPTO is obligated to provide particular findings related to its conclusion, and those findings must be clear and particular. *Id.* A broad conclusionary statement, standing alone without support, is not “evidence.” *Id.*; *see also, In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001).

In addition, a rejection cannot be predicated on the mere identification of individual components of claimed limitations. *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000). Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *Id.*

Claim 4 depends from claim 1 via claim 2, and therefore includes all the recitations of claim 1 by virtue of its dependency.

The Examiner acknowledges that Ikata et al. fails to teach or suggest disposing a radio frequency antenna on a metal frame of an integrated circuit package. *See* page 4 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Masahito supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Masahito discloses, *inter alia*, a MMIC package comprising an antenna (201) and an amplifying circuit (202) enclosed in a cavity in an airtight case (204). The case has metal lining the cavity enclosing the antenna and amplifying circuit. *See* Fig. 13 of Masahito.

The combination of Ikata et al. and Masahito fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, as recited in claim 1 and included in claim 4. At best, the combination of Ikata et al. and Masahito discloses an assembly with a case

enclosing an antenna and an amplifying circuit, wherein the amplifying circuit might use phase matching circuit patterns to match the antenna impedance. It is fairly obvious that the combination of Ikata et al. and Masahito fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, since both references disclose that the radio frequency antenna is not part of the integrated circuit package. *See* col. 5, lines 24-36 of Ikata et al.; antenna (201) shown in Fig. 13 of Masahito. Furthermore, the Examiner alleges that Masahito discloses the placement of a radio frequency antenna on a metal frame, and further alleges that reference numeral 203 teaches this feature. *See* page 5 of the February 6, 2003 Office Action. Reference numeral 203 in Masahito actually points to a terminal that pierces the airtight case (204), and there is no discussion in Masahito that the terminal (203) is a radio frequency antenna. Furthermore, assuming *arguendo* that the antenna (201) is mounted on a metal frame, the metal frame does not comprise a portion of the integrated circuit package. The combination clearly does not teach or suggest that a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 1 and included in claim 4 by virtue of dependency. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Masahito disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on-the record as to why one of skill would be motivated to combine the two references. Without a motivation to combine, a rejection based on a *prima facie*

case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). Here, other than a conclusionary statement that it would have been obvious to combine the references, there have been no objective findings on the record as to motivation. Critically, both references lack any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al. and Masahito fails to disclose all of the claimed elements as arranged in claim 1, and included via dependency in claim 4. Therefore, the combination of Ikata et al. and Masahito clearly cannot render the present invention obvious as recited in claim 4. Thus, Applicants believe that claim 4 is in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claim 4.

3. Claims 6-8 and 16-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Koichi (Japanese Patent No. Showa 63-1818505) and Yoshitaka (Japanese Patent No. Heisei 6-085530). Applicants traverse the rejection of claims 6-8 and 16-18 at least for the reasons set forth below.

Claims 6-8 depend from claim 1 via claim 5, and therefore include all the recitations of claim 1 by virtue of their dependency.

The Examiner acknowledges that Ikata et al. fail to disclose a metal pattern that is a metal slot pattern. *See* page 5 of the February 6, 2003 Office Action. The Examiner alleges that the disclosures of Koichi and Yoshitaka supply the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Koichi discloses, *inter alia*, a S-shaped slot antenna having a cavity resonator. *See* Abstract of Koichi. Yoshitaka discloses, *inter alia*, a micro-strip antenna. *See* Abstract of Yoshitaka.

As a threshold matter, the Examiner appears to allege that Ikata et al. discloses planar metal patterns for a radio frequency antenna. *See* page 5 of the February 6, 2003 Office Action. As discussed above at length with respect to the § 102(b) rejection of claim 1, the phase matching circuit patterns (37a-37b) are attached to an *external* antenna through an external connection terminal (36c). *See* col. 5, lines 24-36 of Ikata et al. There is no disclosure in Ikata et al. that the phase matching circuit patterns (37a-37b) somehow function as radio frequency antennas.

The combination of Ikata et al., Koichi and Yoshitaka fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, as recited in claim 1 and included in claims 6-8 via dependency. At best, the combination of Ikata et al., Koichi and Yoshitaka discloses an assembly with an electronic circuit, wherein the electronic circuit might use phase matching circuit patterns to match the impedance of an external antenna mounted elsewhere. It is fairly obvious that the combination of Ikata et al., Koichi and Yoshitaka fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, since all

the references disclose that the radio frequency antenna is not part of the integrated circuit package. See col. 5, lines 24-36 of Ikata et al.; Abstracts of Koichi and Yoshitaka. While Koichi and Yoshitaka disclose antenna designs, when they are combined with Ikata et al., however, there is no disclosure of where to locate the antenna relative to a ground plane, an integrated circuit die and the integrated circuit package. The combination clearly does not teach or suggest a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 1 and included in claims 6-8 by virtue of dependency. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Koichi nor Yoshitaka disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the three references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the three references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). Other than a conclusionary statement that it would have been obvious to combine the references, there have been no objective findings on the record as to motivation. Critically, all three references lack any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package. The

Examiner has discussed at length that the recited antenna parameters, alleging that such parameters fall within the ambit of routine experimentation and optimization. However, such analysis does not provide any motivation to combine the references, since neither of the references disclose the desirability of a radio frequency antenna that comprises a portion of the integrated circuit package. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al., Koichi and Yoshitaka fails to disclose all of the claimed elements as arranged in claim 1, and included via dependency in claims 6-8. Therefore, the combination of Ikata et al., Koichi and Yoshitaka clearly cannot render the present invention obvious as recited in claims 6-8. Thus, Applicants believe that claims 6-8 are in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claims 6-8.

Claims 16-18 depend from claim 13 via claim 15, and therefore include all the recitations of claim 13 by virtue of their dependency.

Claims 16-18 have similar recitations as claims 6-8, and Applicants believes that claims 16-18 are allowable for at least the same reasons as claims 6-8, namely, the lack of disclosure by the combination of Ikata et al., Koichi and Yoshitaka with respect to a radio frequency antenna that comprises a portion of an integrated circuit package. Applicants further believe that claims 16-18 are allowable as well, at least by virtue of their dependency from claim 13. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claims 16-18.

4. Claims 9-11 and 23-25 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Houghton et al. (U.S. Patent No. 6,282,095). Applicants traverse the rejection of claims 9-11 and 23-25 at least for the reasons set forth below.

Claims 9-11 depend from claim 1, and therefore include all the recitations of claim 1 by virtue of their dependency.

The Examiner acknowledges that Ikata et al. fail to disclose a ball grid array connection. *See* page 7 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Houghton et al. supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Houghton et al. disclose, *inter alia*, several types of connectors, such as ball grid arrays, for electrically connecting integrated circuits to printed circuit wiring. *See* col. 5, lines 11-23 of Houghton et al.

The combination of Ikata et al. and Houghton et al. fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, and wherein the radio frequency antenna is excluded from the integrated circuit die, as recited in claim 1 and included in claims 9-11 via dependency. At best, the combination of Ikata et al. and Houghton et al. discloses an assembly with an electronic circuit, wherein the electronic circuit might use phase matching circuit patterns to match the impedance of an external antenna mounted elsewhere, and uses other types of connectors as well. The combination of Ikata et al. and Houghton et al. fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, since one reference discloses that the radio frequency antenna is not part of the integrated circuit package, and the other reference discloses the undesirability of a strip-type antenna in an integrated circuit. *See*

col. 5, lines 24-36 of Ikata et al.; col. 1, lines 51-53 of Houghton et al. The combination clearly does not teach or suggest a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 1 and included in claims 9-11 by virtue of dependency. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Houghton et al. disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the two references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). Other than a conclusionary statement that it would have been obvious to ~~combine the references with respect to connection technology~~, there have been no objective findings on the record as to motivation with respect to an antenna. Critically, both references lack any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package, and one reference even discusses the undesirability of such an antenna. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al. and Houghton et al. fails to disclose all of the claimed elements as arranged in claim 1, and included via dependency in claims 9-11. Therefore, the combination of Ikata et al. and Houghton et al. clearly cannot render the present invention obvious as recited in claims 9-11. Thus, Applicants believe that claims 9-11 are in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claims 9-11.

Claims 23-25 depend from claim 13, and therefore include all the recitations of claim 13 by virtue of their dependency.

Claims 23-25 have similar recitations as claims 9-11, and Applicants believes that claims 23-25 are allowable for at least the same reasons as claims 9-11, namely, the lack of disclosure by the combination of Ikata et al. and Houghton et al. with respect to a radio frequency antenna that comprises a portion of an integrated circuit package. Applicants further believe that claims 23-25 are allowable as well, at least by virtue of their dependency from claim 13. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claims 23-25.

5. ~~Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable~~
over Ikata et al. in view of Takeshi (Japanese Patent No. Heisei 9-237867). Applicants traverse the rejection of claims 19 and 20 at least for the reasons set forth below.

Claims 19 and 20 depend from claim 13, and therefore include all the recitations of claim 13 by virtue of their dependency.

The Examiner acknowledges that Ikata et al. fail to disclose a plurality of vias around the periphery of a radio frequency antenna. *See* page 9 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Takeshi supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Takeshi discloses, *inter alia*, a module comprised of an antenna element (3) and a high-frequency device (9). Several ground planes (5, 12) are interposed between the antenna element and the high-frequency device. The ground planes have slots (6, 13) that pierce their respective ground planes. *See* Fig. 1 of Takeshi. The antenna element and the high-frequency device are coupled together through the ground plane slots via electromagnetic coupling. *See* English translation of Takeshi, Detailed Description of the Invention, numbered paragraph 0014.

The combination of Ikata et al. and Takeshi et al. fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package and is wired to the integrated circuit die, and wherein the radio frequency antenna is excluded from the integrated circuit die, as recited in claim 13 and included in claims 19 and 20 via dependency. At best, the combination of Ikata et al. and Takeshi discloses an assembly with an electronic circuit, wherein the electronic circuit might use phase matching circuit patterns to match the impedance of an external antenna mounted elsewhere, and uses internal vias to connect various layers. ~~The combination of Ikata et~~
~~al. and Takeshi fails to disclose a radio frequency antenna that comprises a portion of the package~~
~~of an integrated circuit package and which is wired to the integrated circuit die, since one reference~~
~~discloses that the radio frequency antenna is not part of the integrated circuit package, and the other~~
~~reference uses an antenna that is part of the integrated circuit die and is electromagnetically coupled.~~
See col. 5, lines 24-36 of Ikata et al.; *See* Fig. 1 of Takeshi. Moreover, the combination of Ikata et

al. and Takeshi clearly shows that the vias are *internal vias*, and no vias are shown in any radio frequency antenna. *Compare* Fig. 1 of Takeshi with Applicants' claim 13. The combination clearly does not teach or suggest a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 13 and included in claims 19 and 20 by virtue of dependency. Applicants believe that the Examiner has not met the "all limitations" prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since Ikata et al. does not disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package and Takeshi uses electromagnetic coupling instead of vias, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the two references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. ~~*In-re-Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002).~~ Here, other than a conclusionary statement that it would have been obvious to combine the references, there have been no objective findings on the record as to motivation. Both references lack any teaching about the desirability of a radio frequency antenna, wired to an integrated circuit die, which comprises a portion of the package of an integrated circuit package. Takeshi discloses the use of wiring vias between layers of the integrated circuit, but there is no teach or suggestion of vias connecting to a radio frequency

antenna, since Takeshi discloses electromagnetically couples the radio frequency antenna; no vias are used. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al. and Takeshi fails to disclose all of the claimed elements as arranged in claim 13, and included via dependency in claims 19 and 20. Therefore, the combination of Ikata et al. and Takeshi clearly cannot render the present invention obvious as recited in claims 19 and 20. Thus, Applicants believe that claims 19 and 20 are in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claims 19 and 20.

6. Claim 21 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Masahito (Japanese Patent No. Heisei 8-250913). Applicants traverse the rejection of claim 21 at least for the reasons set forth below.

Claim 21 depends from claim 13, and therefore includes all the recitations of claim 13 by virtue of its dependency.

The Examiner acknowledges that Ikata et al. fails to teach or suggest encapsulating the integrated circuit die. *See* page 10 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Masahito supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Masahito discloses, *inter alia*, a MMIC package comprising an antenna (201) and an amplifying circuit (202) enclosed in a cavity in an airtight case (204). The case has metal lining the cavity enclosing the antenna and amplifying circuit. *See* Fig. 13 of Masahito.

The combination of Ikata et al. and Masahito fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, and wherein the radio frequency antenna is excluded from the integrated circuit die, as recited in claim 13 and included in claim 21. At best, the combination of Ikata et al. and Masahito discloses an assembly with a case enclosing an antenna and an amplifying circuit, wherein the amplifying circuit might use phase matching circuit patterns to match an external antenna impedance. It is fairly obvious that the combination of Ikata et al. and Masahito fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, since both references disclose that the radio frequency antenna is not part of the integrated circuit package. *See* col. 5, lines 24-36 of Ikata et al.; antenna (201) shown in Fig. 13 of Masahito. Furthermore, the Examiner alleges that Masahito discloses the placement of a radio frequency antenna on a metal frame, and further alleges that reference numeral 203 teaches this feature. *See* page 5 of the February 6, 2003 Office Action. Reference numeral 203 in Masahito actually points to a terminal that pierces the airtight case (204), and there is no discussion in Masahito that the terminal (203) is a radio frequency antenna. The combination clearly does not teach or suggest that a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 13 and included in claim 21 by virtue of dependency. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Masahito disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require

the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the two references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). Here, other than a conclusionary statement that it would have been obvious to combine the references based on hermetically sealing a package, there have been no objective findings on the record as to motivation with respect to an antenna. Critically, both references lack any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al. and Masahito fails to disclose all of the claimed elements as arranged in claim 13, and included via dependency in claim 21. ~~Therefore, the combination of Ikata et al. and Masahito clearly cannot~~ render the present invention obvious as recited in claim 21. Thus, Applicants believe that claim 21 is in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claim 21.

7. Claim 22 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Masahito and Moskowitz et al. (U.S. Patent No. 5,528,222). Applicants traverse the rejection of claim 22 at least for the reasons set forth below.

Claim 22 depends from claim 1 via claim 21, and therefore includes all the recitations of claim 1 by virtue of its dependency.

The Examiner acknowledges that Ikata et al. fails to teach or suggest encapsulating the integrated circuit die. *See* page 10 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Masahito supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Masahito discloses, *inter alia*, a MMIC package comprising an antenna (201) and an amplifying circuit (202) enclosed in a cavity in an airtight case (204). The case has metal lining the cavity enclosing the antenna and amplifying circuit. *See* Fig. 13 of Masahito. Moskowitz et al. discloses, *inter alia*, conventional packaging techniques. *See* Figs. 1A and 1B of Moskowitz et al.

The combination of Ikata et al., Masahito and Moskowitz et al. fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, and wherein the ~~radio-frequency-antenna-is-excluded-from-the-integrated-circuit-die~~, as recited in claim 13 and included in claim 22. At best, the combination of Ikata et al., Masahito and Moskowitz et al. discloses an assembly with a case enclosing an antenna and an amplifying circuit, wherein the amplifying circuit might use phase matching circuit patterns to match an antenna impedance. It is fairly obvious that the combination of Ikata et al., Masahito and Moskowitz et al. fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package,

since two of the references disclose that the radio frequency antenna is not part of the integrated circuit package. *See* col. 5, lines 24-36 of Ikata et al.; antenna (201) shown in Fig. 13 of Masahito. The third reference clearly discloses that the antenna is not part of the package of an integrated circuit package, but rather, is enclosed within other packaging. *See* Fig. 3 of Moskowitz et al. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Masahito nor Moskowitz et al. disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the three references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). There have been no objective findings on the record as to motivation. Critically, all the references lack any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants believe that the combination of Ikata et al., Masahito and Moskowitz et al. fails to disclose all of the claimed elements as arranged in claim 13, and included via dependency in claim 22. Therefore, the combination of Ikata et al., Masahito and Moskowitz et al. clearly cannot render the present invention obvious as recited in claim 22. Thus, Applicants believe that claim 21 is in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claim 22.

8. Claim 27 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ikata et al. in view of Sholley et al. (U.S. Patent No. 6,265,774). Applicants traverse the rejection of claim 27 at least for the reasons set forth below.

Claim 27 depends from claim 1, and therefore includes all the recitations of claim 1 by virtue of its dependency.

The Examiner acknowledges that Ikata et al. fails to teach or suggest a wire having a length of one-quarter to one-half wavelength. *See* page 11 of the February 6, 2003 Office Action. The Examiner alleges that the disclosure of Sholley et al. supplies the necessary disclosure to overcome the acknowledged deficiencies of Ikata et al. Sholley et al. disclose, *inter alia*, a package for reducing electromagnetic interference between components. *See* Fig. 1 of Sholley et al.

The combination of Ikata et al. and Sholley et al. fails to teach or suggest a radio frequency antenna that comprises a portion of an integrated circuit package, and wherein the radio frequency antenna is excluded from the integrated circuit die, as recited in claim 1 and included in claim 27. At best, the combination of Ikata et al. and Sholley et al. discloses an assembly with an

electromagnetic shield enclosing amplifying circuit, wherein the amplifying circuit might use phase matching circuit patterns to match an external antenna impedance. It is fairly obvious that the combination of Ikata et al. and Sholley et al. fails to disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, since one reference discloses that the radio frequency antenna is not part of the integrated circuit package, and the other ignores the question completely. *See* col. 5, lines 24-36 of Ikata et al.; *See* Sholley et al. generally. The combination clearly does not teach or suggest that a radio frequency antenna comprising a portion of the package of an integrated circuit package, as recited in claim 1 and included in claim 27 by virtue of dependency. Applicants believe that the Examiner has not met the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Since neither Ikata et al. nor Sholley et al. disclose a radio frequency antenna that comprises a portion of the package of an integrated circuit package, Applicants believe that one of skill in the art would not be motivated to combine the two references. *In re Dembiczak* and *In re Zurko* require the Examiner to provide particularized facts on the record as to why one of skill would be motivated to combine the two references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Examiner must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). There have been no objective findings on the record as to motivation, other than a discussion concerning routine experimentation and optimization. Critically, both references lack

any teaching about the desirability of a radio frequency antenna that comprises a portion of the package of an integrated circuit package. Applicants believe that the Examiner has not met the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

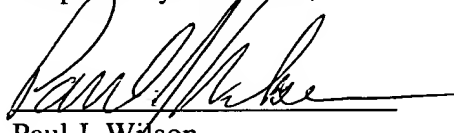
Based on the foregoing reasons, Applicants believe that the combination of Ikata et al. and Sholley et al. fails to disclose all of the claimed elements as arranged in claim 1, and included via dependency in claim 27. Therefore, the combination of Ikata et al. and Sholley et al. clearly cannot render the present invention obvious as recited in claim 27. Thus, Applicants believe that claim 27 is in condition for allowance. Applicants respectfully request that the Examiner withdraw the § 103(a) rejection of claim 27.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO. 09/784,015
~~ATTORNEY DOCKET NO. Q62388~~

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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Date: June 6, 2003
